Environmental Simulation Center

Main Street Corridor Revitalization Project Phase II: Evaluation

City of Houston Planning & Development Department

DELIVERABLE 7: FINAL SUMMARY REPORT

Submitted by:
The Environmental Simulation Center, Ltd.
116 West 29th Street
New York, NY 10001

Principal authors: George M. Janes, AICP
                       Paul H. Patnode, AICP

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1.0   Overview

1.1   Purpose

The purpose of this document is to summarize Tasks 1-5 of the Main Street Corridor Revitalization Project: Phase II: Evaluation, development and concepts behind the Land Development Model (LDM) and the Performance Report Card (PRC). It focuses on elements that are not well documented in previous reports or items that materially changed from earlier documentation. Section 3 speaks to the transferability of the system and methods to other areas in the City of Houston and other local governments.

Training materials that are also a part of this deliverable have been submitted under a separate cover.

1.2   Summary of products

During the course of this project, the Environmental Simulation Center (ESC) developed a Land Development Model to track change and allocate future year growth to small areas within the Main Street Corridor. The ESC also developed a Performance Report Card that evaluates that change against various community goals and indicators.

1.2.1 The Land Development Model

1.2.1.1 LDM Method

The Land Development Model was developed as a two-part process, the first part tracked change in the Corridor as it occurred. It did this by converting development activity, tracked through building permits, to housing units, households and jobs and then added that increment to 2000 base data provided by H-GAC. The second part of the LDM process took the difference between 2003 growth estimated through building permits and 2007 growth provided by H-GAC through their implementation of UrbanSim and allocated that growth to small areas using a measure called Development Suitability. ESC designed Development Suitability to mimic the attractiveness of land to development. It takes into account vacant land and vehicle and transit access. The LDM's summary level was a uniform grid cell of 1000 feet square.

The LDM was designed so that all formulas and assumptions were user-editable along with inputs like control totals and could be maintained and operated by the users themselves.

1.2.1.2 Implementation

The Land Development Model was implemented in the Scenario Constructor module of CommunityViz 1.3, which is a commercially supported extension to ArcView GIS. ESC acquired the software, developed the model and installed the system on City of Houston's computers. CommunityViz 1.3 will only function with a licensed copy of ArcView 3.2 or 3.3. A screenshot of the interface follows:
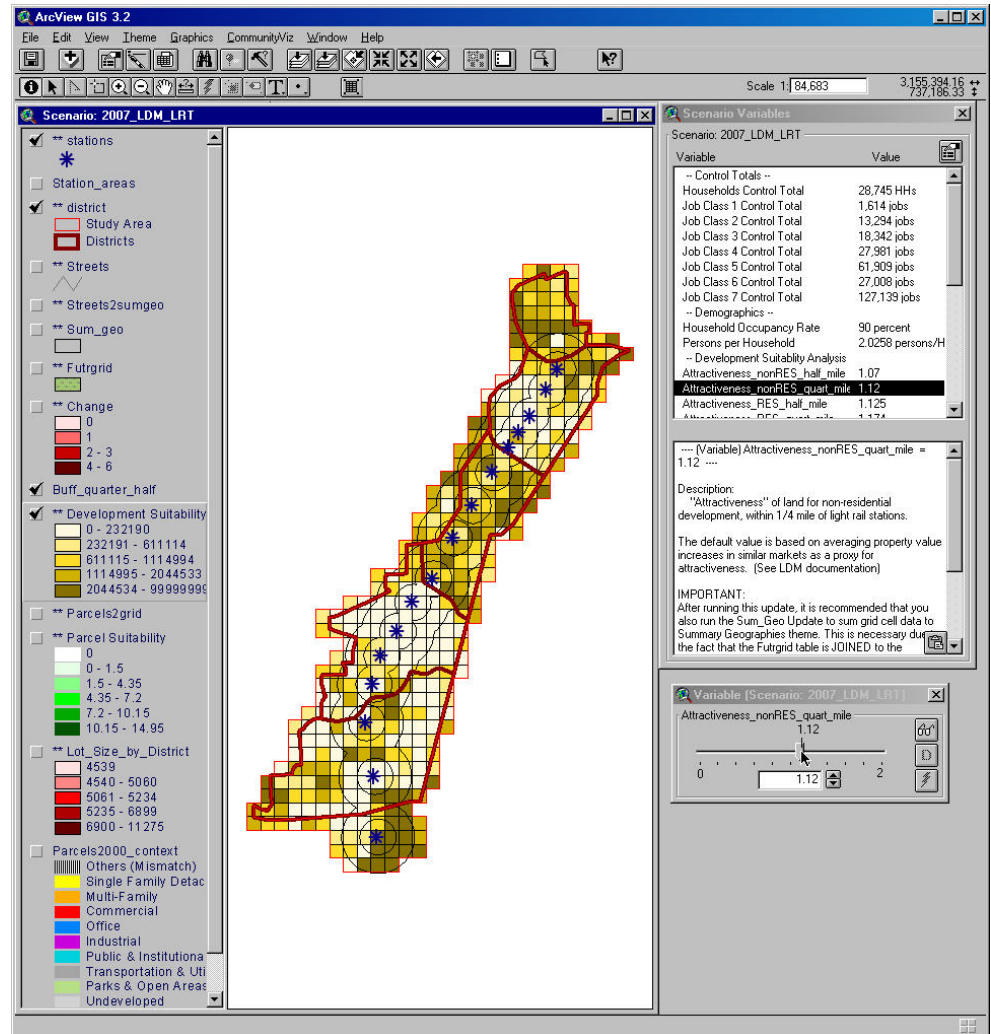
Should the City decide to migrate to an ArcGIS 8.3 environment, CommunityViz 2.0, functions on that platform and is scheduled to be released in early 2004. CommunityViz 2.0 is reported to have utility that will transfer CommunityViz 1.3 LDM scenarios to CommunityViz 2.0.

1.2.2 The Performance Report Card

The Performance Report Card evaluates change against indicators that are important to the community. For example, as population growth happens in the Main Street Corridor, the PRC shows this change as positive, negative or neutral according to community goals.

1.2.2.1 PRC Method

The ESC read and summarized all goals and objectives, performance measures and benchmarks from the various plans and reports developed for the area. We then

took these findings to P&D staff and finalized a list of five goals and 25 performance measures that were then built into the performance report card.

The Performance Report Card analyzed the performance of change in the Corridor against these five goals using the 25 performance measures as a way to evaluate performance. The PRC was designed to be queried geographically by study area, District, Corridor and station areas.

1.2.2.2 Implementation

The PRC was implemented as a plug-in to Excel. A licensed copy of Excel is required to operate the Performance Report Card. A screenshot of the PRC interface follows:
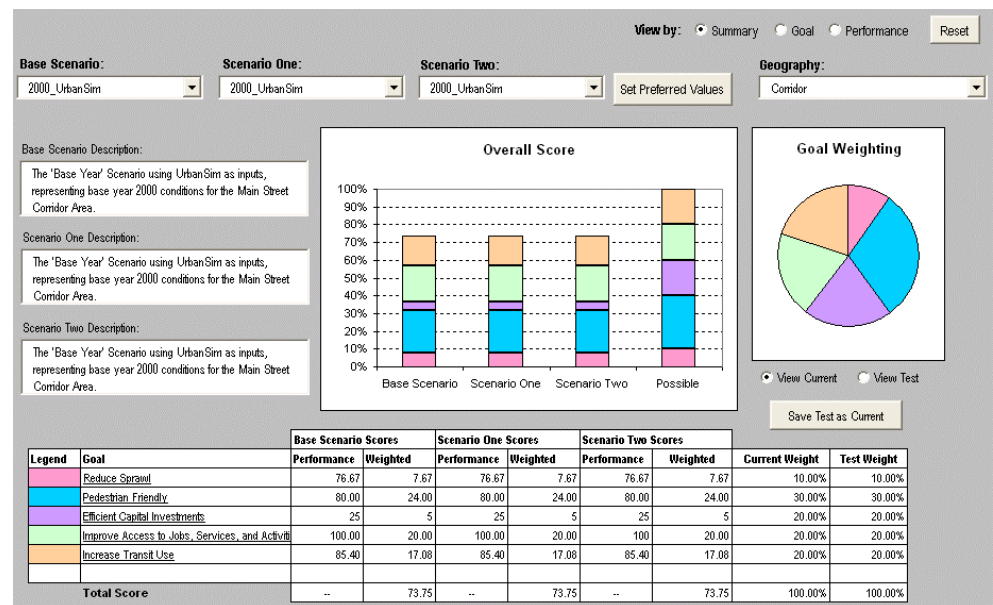
The PRC was designed to allow users to evaluate the performance of each of the Goals, create their own Goals, weight schemes differently according to changing objectives and query each by geography.

2.0   Deliverable Summary

The ESC delivered the following five deliverables summarized by this report:

- ➢ Deliverable 1: Preliminary Design: Land Development Model & Performance Report Card
- ➢ Deliverable 2: Final Design: Land Development Model & Performance Report Card
- ➢ Deliverable 3: Draft Land Development Model & Performance Report Card
- ➢ Deliverable 4: Tested, revised and implemented Land Development Model & Performance Report Card
- ➢ Deliverable 5: Analyze UrbanSim output with Land Development Model output

2.1   Deliverable 1: Preliminary Design

The preliminary model design was contained in Deliverable 1 and was delivered in April 2003. It focused on the Performance Report Card & Land Development Model preliminary design. It also evaluated software products in which the PRC and the LDM could be implemented.

2.1.1 PRC Preliminary Design

The PRC preliminary design focused on reviewing plans and documents produced over the recent past including TCSP, Main Street Corridor Economic Impact

Study, Main Street Coalition Strategic Plan, the Main Street Corridor Master Plan, the Main Street Corridor Planning and Research Project, and ULI's Planning Development Guidelines for the Main Street Corridor. From that summary, five themes emerged:

A.   Transportation (the quality, efficiency, and effectiveness)
B.   Physical Improvements (the public/ private built environment)
C.   Land-Use (the activities housed in the built environment)
D.   Cost/ Benefit (actions, indicators, and measures of costs and benefits)
E.   Administrative Regulatory Incentives and Controls (their adoption, use, and effectiveness)

Under these five themes Deliverable 1 summarized an exhaustive list of 55 goals, sub-goals and performance measures. At a meeting with the client after this deliverable was delivered, the list was trimmed to 5 goals and 25 performance measures, which were detailed in the final design (Deliverable 2, see Section 2.2.1).

2.1.2 LDM Preliminary Design

Deliverable 1 presented three methods for the LDM and discussed the methods' relative strengths and weaknesses. The methods discussed were:

➢ Constant share,
➢ Constant share on an estimated base
➢ Allocation via development suitability on an estimated base.

We recommended the LDM be developed as the third method, because even while it was the most complicated, it would produce the most accurate results by using the most current information available.

2.1.3 Software Evaluation

Deliverable 1 contained an evaluation of three software packages that might have been appropriate for the implementation of the LDM. The software packages evaluated were CommunityViz, Index and Place3s. The ESC recommended using the Scenario Constructor module of CommunityViz because it was open and transparent and could accommodate the Land Development Model. This deliverable identified Scenario Constructor's reporting and graphing functions as its major weakness and doubted it could be used as a platform for the PRC.

2.2   Deliverable 2 Final Design

2.2.1 PRC Final Design

After Deliverable 1 was delivered, the ESC visited Houston and discussed the exhaustive list of goals and performance measures presented in Deliverable 1. These were then organized into five main goals:

A. Reduce Sprawl and Induce Inner City Revitalization by Capturing a Larger Share of Regional Development Activity.
B. Promote a Pedestrian Friendly Environment in the Corridor Through Changes in Land Development Resulting from the Integration of Land-Use and Transit.
C. Reduce Future Capital Investments by the Efficient Utilization of Existing Infrastructure and Leveraging of Public/ Private Investments.
D. Improve Access to Jobs, Services, and Cultural Activities by Increasing Employment in the Corridor and Visitors to the Corridor.
E. Reduce Traffic Congestion and Auto Emissions through Increased Use of Transit in Corridor and Connectors.

And under these goals were 25 performance measures that when taken together fed into how the performance of the goal was measured. The full list of performance measures follows. The notation after them notes from which source they came:

> ➢ TCSP,
> ➢ Main Street Coalition Strategic Plan (MSC),
> ➢ Urban Land Institute (ULI),
> ➢ Main Street Corridor Master Plan (MSCMP)

A.   Reduce Sprawl and Induce Inner City Revitalization by Capturing Larger Share of Regional Development Activity.

A.1. Increase density as a component of inner city revitalization and reduction of sprawl. (TCSP)

A.2. Increase the mix of land-uses in the Corridor to make the Corridor a more complete place. (TCSP)

A.3. Utilize adaptive re-use techniques on existing/ historical buildings. (MSC/ MP)

A.4. The introduction of Light Rail should lead to an increase in the number of jobs in the Corridor. (TCSP/ Economic Impact Study)

A.5. The introduction of Light Rail in the Corridor will increase revenue to the City of Houston Economic Impact Study)

A.6. Regulations that would encourage more efficient and dense layouts.

B. Promote a Pedestrian Friendly Environment in the Corridor Through Changes in Land Development Resulting from the Integration of Land-Use and Transit.

> **B.1. and B.2.** Increase opportunities for people to walk or use transit to make trips from home. (TCSP/ MSC).
>
> **B.3.** Promote walking and the use of transit by increasing the number of jobs within walking distance of transit (TCSP/MSC)
>
> **B.4.** Enhance the pedestrian's experience and promote the use of transit by infilling with new development on vacant land and surface parking lots. (TCSP)
>
> **B.5.** Promote walking and use of transit through landscaping and trees to provide shade and enhance the pedestrian experience (MSCMP).
>
> **B.6.** Promote the development of mixed-use transit oriented developments. (TCSP)
>
> **B.7.** Enhance the pedestrian experience by promoting the quality of projects built in the corridor. (MSC)
>
> **B.8.** Develop and adopt Area Plans that are designed to encourage the qualities unique to the district, enhance the pedestrian experience and promote walkability, and the use of transit. (ULI)
>
> **B.9.** Develop and adopt infrastructure, engineering, and urban design standards governing public rights -of-way for each district and the Corridor (ULI)

C. Reduce Future Capital Investments, Efficiently Utilize Existing Infrastructure, and Leverage Public/ Private Investments.

> **C.1.** The introduction of Light Rail in the Corridor should leverage private investments. (Economic Impact Study)
>
> **C.2.** Support public/private partnerships through the development of joint projects in the Corridor (MSC).
>
> **C.3.** Construct improvements that link different areas of the Corridor and provide a sense of connection. (MSC)
>
> **C.4.** Provide financial assistance for right-of-way and general improvements such as affordable housing, shared parking, etc. (ULI)

D. Improve Access to Jobs, Services, and Cultural Activities.

> **D.1.** Increase in the number of jobs in the corridor (TCSP) (Note: similar to A.4)

> **D.2.** Increase the diversity and number of trips in the corridor by district.

E. Reduce Traffic Congestion and Auto Emissions through Increased Use of Transit in Corridor and Connectors.

> **E.1.** Change the public's perception of the quality of the transit system (TCSP).

> **E.2.** Increase the public's use of transit (TCSP)

> **E.3.** Improve parking resources at station locations (MSC).

> **E.4.** Increase high density housing opportunities near transit.

The importance of each measure and how it impacts performance is by default set to be equal to the other measures. Users are expected to change that value to suit their needs.

These five goals and 25 measures detailed in Deliverable 2 are what were ultimately programmed into the PRC.

2.2.2 LDM Final Design

The Land Development Model method was detailed in this deliverable. It was described as a two-part process, the first part developed current year estimates. The second part allocated future year growth.

2.2.2.1 Current Year Estimates

Current year estimates for housing units, households and population were described as using a housing unit method as derived from building permits, and was implemented exactly as described in that document.

Estimates of place of work employment also used building permits but were more complicated because the number of employees per square foot varies according to building structure type. As a part of its input, UrbanSim uses an employee per square foot by building land use. These same assumptions H-GAC used in UrbanSim were modified to fit City of Houston building permit coding and were applied to building permit data to produce place of work employment estimates. The final employee per square foot by structure type used were:

CoH Building Permit Category	EMP_PER_SQ
One_Family Houses	0
Two-family Buildings	0
Three and four-family Buildings	0
Five-or-more Family Buildings	0
Moved or Relocated (res)	0
Hotels	1000
Other shelter (Non-Housekeeping)	0
Amusement and Recreational Buildings	2000
Churches and other Religious Buildings	5000
Industrial Buildings	1000
Parking Garages	15000
Residential garages and carports	0
Service Stations and Repair Garages	600
Hospital and other Institutional Bui	500
Office, bank, and Professional Build	350
Public Works and Utilities Buildings	1285
Schools and other Educational Buildings	1000
Stores and other Mercantile Building	500
Other non-residential Buildings	0
Structures other than Buildings	0
Housekeeping and Residential Buildings	0
All Other buildings and Structures	0
One_Family Houses	0
Two-family Buildings	0
Three and four-family Buildings	0
Five-or-more Family Buildings	0
All Other buildings and Structures	0
Mobile Homes	0

Like all assumptions, users can change these assumptions if they desire.

There remain issues with building permits. First, so little information is collected on demolitions as to make the information that is collected unusable in this method, and, thus, creating a known positive bias. Second, there appear to be issues with consistent coding and with some of the fields. Planning and Development may want to double-check the size of buildings with large construction values but very small size including the convention center expansion.

Nevertheless, we feel building permits is still a good source for current year data and these shortcomings are a product of a data source being used in a new way. If closer attention is paid to how these data are collected and managed for use outside of the building department, then their quality should improve.

2.2.2.2 Future Year Allocation

Future year growth was allocated according to development suitability, which is discussed in detail in the next section. Development suitability acts as a magnet for future growth. The larger the score, the more growth the area will attract. So, using households as an example, imagine an area with 3 grid cells and 1,600 households. Hypothetical development suitability scores are also listed for each grid.

GridID	Base year households	Development suitability (DS) score
1	100	1000
2	1,000	100
3	500	500
Total	1,600	1,600

Assume in this hypothetical example that control totals for the area require 2000 future year households. This means there are 400 households to allocate. Households would be allocated proportionally according to the development suitability score. Or, in formula:

$$HH(FY)_{GRID} = HH(BY)_{GRID} + \left(\left(HH(FY)_{REGION} - HH(BY)_{REGION} \right) * (DS_{GRID} \div \sum_{GRID=1}^{n} DS) \right)$$

Where:

HH = households,
FY = future year,
BY = base year, and
DS = development suitability

Or, in practice, using GridID 1 from the above example,

GridID 1=100 + ((2000-1600)*(1000/1600))

GridID 1=350

For each of the three hypothetical grids in the above example this algorithm produces the following:

GridID	Base Year HHs	Resid. DS score	New HHs	Future HHs	
1	100	1000	250	350	
2	1000	100	25	1025	
3	500	500	125	625	

Place of work employment was allocated in exactly the same way except that different development suitability scores were developed for each land use type (Industrial, Institutional, Office, Hotel, Commercial and Garage) and then converted to employment by job class using the following matrix:

"Industrial" class

LU Class	Durable Manu	Non-durable Manu	Extraction	Const - TCU	Services	Retail	Public	Total
IND	0.45	0.40	0.10	0.05	0.00	0.00	0.00	1.00
INST	0.00	0.00	0.00	0.00	0.25	0.00	0.75	1.00
OFF	0.05	0.05	0.05	0.10	0.40	0.05	0.30	1.00
HOTEL	0.00	0.00	0.00	0.00	0.95	0.05	0.00	1.00
COM	0.00	0.00	0.00	0.00	0.05	0.95	0.00	1.00
GAR	0.05	0.00	0.00	0.00	0.35	0.30	0.30	1.00

All rows sum to one so that all land use class employment gets allocated to an industrial class[1]

2.2.2.3 Development Suitability

The Development Suitability Analysis (DSA) is designed to be a proxy for the real estate development decision-making process. In the absence of zoning to determine a legal holding capacity, the DSA will rely primarily on development criteria that mimic supply of land and access to land. The variables used in developing the DSA are:

- Vacant land/surface parking lots, and land where the primary structure is unsound;
- Context/Predominate land use;
- Typical lot size by district;
- Fronting traffic;
- A placeholder for user-defined attractiveness;
- Proximity to light rail and Metro transit.

As discussed in Section 2.2.2.2 above, future year development will be allocated according to development suitability where a score will measure how attractive land is for development. Geographically the DSA was designed to function at the parcel level and then aggregated to grid cell.

DSA first examines each parcel for the following:
- Is the parcel vacant, have surface parking lots or contain structures that are unsound? If so then DSA starts with a one.
- The predominance of land uses near a given parcel. This is done by looking at the mix of land uses (from the most recent HCAD tax records) within the 1000-foot grid cell nearest the parcel, and scoring the parcel for

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[1] Job class as defined by H-GAC is actually a combination of class of worker and industrial class of the job. In this summary system a teacher who worked in a public school would be classified as a public employee while a teacher that worked in a private school would be classified under services.

each potential use. The score is determined by the existing percent share a given land use has over the total share. (0-1).

- The appropriateness of lot size for any potential use. The is scored by determining the mean lot size by district for each use, as well as the upper and lower limits of one standard deviation around the mean. If a parcel matches the mean exactly, it would get a "1" for a score. If it above the upper limit, or below the lower limit, it gets a "0". If it somewhere in between, it gets a score between "0" and "1" depending on how close it is to the mean.

- The suitability score for fronting traffic is based on HCAD Tax Assessors data, which assigns a code to each parcel that indicates whether the fronting traffic is light, medium, or heavy. Depending on the potential land use, a score of "0", "0.5", or "1" is assigned to the parcel. For instance, a parcel on a busy street would get a "1" for suitability for commercial development, but a "0" for residential development. The same parcel would have reversed scores for suitability for residential development

The three criteria can be weighted through a user-defined assumption and then summed. This score is multiplied by a "develop-ability" factor that can be user-modified on a parcel-by-parcel basis, or by query, to create an overall parcel score for each potential land use. For this model, the "develop-ability" is determined to be land that is available for development. Therefore, the model identifies parcels that are vacant or all surface parking, or parcels where the primary structure is unsound. This data comes from HCAD parcel data through the "Usecode" classification and a lookup table that links "Usecode" with development potential.

The parcel scores for each land use are then summed to the grid cell level, where they are weighted for "attractiveness" for development based on proximity to rail. This produces cell-based development suitability scores based on land use (Residential, Industrial, Institutional, Office, Hotel, Commercial and Garage). The non-residential scores are then converted to development suitability by employment by job class.

Ultimately, development suitability scores are generally highest in Midtown with some notable capacity in the extreme south. The following image is a thematic map of residential development suitability using the default method delivered with the LDM.
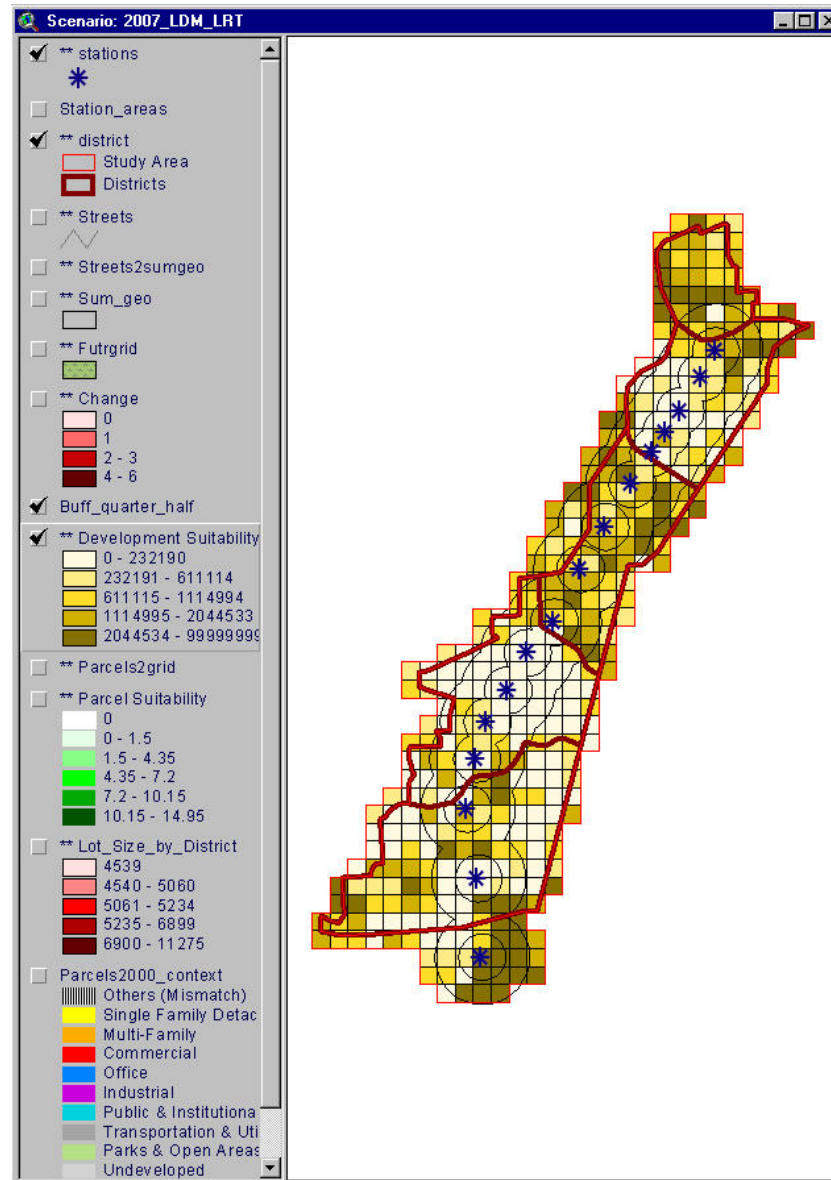
2.3 Deliverable 3: Draft Model Delivered

The draft LDM and PRC was delivered in June 2003. In July, a training was conducted that focused on how 2000 base data were updated to 2003. The model was annotated within Scenario Constructor and also short written training materials were delivered along with complete Scenario Constructor training materials.

2.4 Deliverable 4: LDM & PRC Tested, Revised and Implemented

The LDM and the PRC were tested and extensively examined in July and August 2003. This testing suggested changes that addressed usability and performance. These changes were implemented and delivered to the client in September. Virtually all of the changes addressed structural model implementation issues rather than model methods, which were unchanged from Deliverable 2. ESC conducted a final training that included another revised version of the LDM and the PRC in October. This training focused on maintenance tasks (e.g. how does one create current year estimates from building permit data, how does one change an assumption, etc.)

Even with these constant performance improvements, the LDM still takes a long time to run. This is because some base data, notably Development Suitability uses parcel data. These parcels are intersected with all geographic levels, making for computationally intensive queries and calculations.

2.5 Deliverable 5: Analyze UrbanSim output with Land Development Model output

Deliverable 5 analyzed the results of the LDM and UrbanSim and the relative performance of each. There were four comparisons made focusing on change in households and place of work employment. The most significant finding was that household growth in the Corridor is occurring at a much higher rate than the regional forecasts would suggest.

2.5.1 Households

The LDM showed nearly as much household growth in the corridor 2000-2003 as UrbanSim showed 2000-2007, suggesting that UrbanSim is not forecasting enough household growth in the Corridor. The LDM showed the distribution of household growth in the Corridor 2000-2003 was very spotty with a few grid cells getting a great deal of growth while others showed little or no growth. This followed the pattern of building permits issued during the period. 2007 LDM households were only marginally different from 2003 LDM households as 2007 households were controlled to UrbanSim's 2007 totals as a control leaving very little growth to allocate in the period 2003-2007.

Also of interest is the comparison that looked at UrbanSim's 2000 base data versus the 2000 Census long-form data and found that there were significant and unnecessary differences at the grid cell level.

2.5.2 Place of Work Employment

Growth in place of work employment was slower than household growth in both the LDM and UrbanSim. The LDM showed that about 55% of the job growth UrbanSim showed 2000-2007 occurred 2000-2003, a much more reasonable result than household growth. In fact, the correlation between UrbanSim's 2007 figure and the LDM's 2007 for employment at the grid cell level was over 0.99 with most

of the significant differences occurring in areas with non-residential development activity 2000-2003.

2.5.3 Performance

The Performance Report Card was used to measure the outputs of the models in terms of attainment of community goals. These goals are made up of survey-based, qualitative data as well as model-produced, quantitative data. Since UrbanSim only produces quantitative data, comparisons of the Corridor's performance using the two models (UrbanSim and LDM) can only be made for that type of data.

Overall, the outputs of the two models were very similar. Therefore performance, in terms of attainment of community goals, was very similar. Both models indicate that the corridor is making progress towards reaching its goals.

However, each model produced some anomalous outputs that make it appear that, for certain goals, one model was indicating better "performance" than the other. Notably the LDM indicates much higher performance in "Reducing Sprawl". This was due partially to an increased amount of density as a result of the higher-than-expected growth in 2000-2003. This early-occurring growth also meant more income-generating valuations that significantly raised the cumulative revenue to the City over the same amount of time. UrbanSim indicated much better performance toward the goal of "Efficient Capital Investments" because of its lower ratio of public to private investment. However, this result was simply because UrbanSim did not capture several large public projects that occurred 2000-2003 and so therefore had a better performing ratio. UrbanSim also indicated slightly better performance for the goal of "Pedestrian-friendliness" due to a higher number of dwelling units within walking-distance to transit. This is a potentially anomalous result due to higher numbers of households in general produced by the increasing vacancy rate and larger household size of the UrbanSim model.

The outputs of the two models related to the remaining goals, namely "Increase Access to Jobs, Services, and Cultural Activities" and "Increased Transit Use", were very similar. Therefore, performance was very similar.

3.0   Transferability and Final Thoughts

3.1   Transferability

3.1.1 Transferability within the City of Houston

The Land Development Model can be expanded to other areas of the City of Houston easily. All the LDM needs are data that cover the areas desired in the same format as data in the Main Street Corridor. Given these inputs, the LDM should produce results the same way it does for the Main Street Corridor. In theory the LDM can be expanded to the entire City. In practice, however, computationally intensive queries and calculations used by the LDM may make such an expansion on a standard CPU unworkable unless there was a tested system of a multiple client- server system set-up. Such expansion would require further research and testing before we can conclude it is possible.

The Performance Report Card would have to be modified to accommodate different geographies. As delivered, the PRC has the predefined analysis geographies of the Corridor, City of Houston District, station areas, but other than that limitation, there is no reason it could not be applied to other areas in the City.

3.1.2 Transferability to Other Local Governments

The methods used by the LDM are transferable to other local governments. The platform and the scenarios are also transferable. To use the LDM, local governments would have to provide it data in the same format as used in the City

of Houston. Because the LDM uses grid level UrbanSim data as a base, however, its direct transferability would be limited to other local governments that have access to these data or could develop these data. But even if these data are not available, the methods are transferable; there is nothing specific to the Main Street Corridor that would prevent another community from using the methods.

The PRC, however, is designed specifically for the Main Street Corridor. All the goals and performance measures come right out of plans developed for the Corridor and the City of Houston. We would not expect that other local governments would have the same goals or want to use the same performance measures as such things are, by definition, local.

Nevertheless, there are good reasons other local governments would want to use the LDM by itself including tracking change, seeing where development activity might occur in the future or using it to produce estimates that can be used to evaluate forecasts and in planning decision-making.

3.2   Final Thoughts

A concept that is obvious to the layperson: use the most current information to make decisions about your community, is not a concept that has been embraced by those who develop regional forecasting models. Consumers of models and the data they produce have come to accept that there is always a lag between what they know and what is reflected in their data.

There are a host of practical reasons why the planning community has not developed systems that can both produce and use real-time data. Most of these reasons have to do with time, money and process. Already, developing regional small area forecasts is a multi-year process. Adding a layer on top of that process to produce current month and year estimates would be complex and would take extra time and effort. Further, there is a process in place that needs time to perform the work required of it, and that process does not allow for constantly changing data.

But shouldn't it?

We live in an era of real-time information systems. As far as we are aware, the LDM is the first real-time, small-area, planning management system that has been developed for and used by a municipality in this country. As a proof-of-concept it shows that such a system can be built for planning. But, clearly, in other industries that are less process oriented and have more resources, such information systems are the norm. Can we imagine General Motors updating their forecasts of car sales like regional planners, once a year or once every three years? Of course not. Real-time data for real-time decision-making has become a critical component of survival in industry, yet remains an unaffordable luxury in planning.

Admittedly, there have been great strides forward recently in getting information out to the public. In many communities, current assessor's data, zoning, land use

and hosts of other data can now be downloaded from the Internet or mapped in real time in a web browser. Easy access to this information has made a great contribution to rational decision-making, not only in planning, but also in any industry that uses this information.

But these advances in data dissemination should not be confused with advances in planning information systems; users that access these data are left to decide what the information means. While such access is fine for some applications, small area estimating and forecasting are not trivial problems. Millions of federal dollars have been spent supporting the development of UrbanSim. Years were spent developing the base data and running the models at H-GAC, yet the results are easily disparaged because they don't take into account developments we can see because they are already on the ground.

It doesn't have to be this way. We shouldn't accept this level of inaccuracy and we should not make decisions using data we know are wrong. We only accept such situations because we have become accustomed and comfortable with inaccuracy.

The LDM says that avoidable inaccuracy is not acceptable; if you know a development happened, then your model should know that development happened. With careful attention paid to a higher demand for accuracy, the LDM gives the City of Houston a real-time information system for tracking change as it occurs. Not only is such an ongoing effort important to the Main Street Corridor revitalization process and supports the goals of the TCSP, but also we hope the LDM can be held up as a national model as a cost-effective way to produce better data for real-time decision-making.